Methodology for Determining "Final Stabilization"

"Final Stabilization" is a stipulation that must be met in order for an operator of a construction site to submit a Notice of Termination (NOT) to the Arizona Department of Environmental Quality (ADEQ) under the Arizona Pollutant Discharge Elimination System (AZPDES) Permit Program (Permit No. AZG2003-001). A NOT is submitted by the operator to terminate coverage for discharges from construction activities to waters of the U.S.

According to AZPDES, "Final Stabilization" means that either:
1.   All soil disturbing activities at the site have been completed and either of the two following criteria are met:
   a.   A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or
   b.   Equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
2.   When background native vegetation will cover less than 100% of the ground (e.g., arid areas, beaches), the 70% coverage criteria is adjusted as follows: if the native vegetation covers 50% of the ground, 70% of 50% $(.70 \times .50 = .35)$ would require 35% total cover for final stabilization. On a beach with no natural vegetation, no stabilization is required.

A methodology for determining final stabilization for native seeded/unpaved areas is described below.

Within seeded areas, sample plots with a nominal size of 100 square feet shall be used for projects that occur within low rainfall areas (defined as locations receiving 20 inches or less average annual rainfall). Sample plots with a nominal size of 25 square feet shall be used for all other project locations. The rationale for the larger plot size in low rainfall areas is that a larger sample size is necessary to accurately measure the vegetative cover, which is expected to be less dense than in areas of higher rainfall. As an option, data may be gathered at the 100-square-foot plot locations by means of four 25 square foot sub-plots established at that same location.

Multiple sample plots may be required on a project site; the number of samples shall be determined by the total disturbance area of the project. The total area represented by the sample plots shall be approximately 0.1% of the total site disturbance area. For example, a project in a low rainfall area with 600,000 square feet of disturbance would require six sample plots (for a total sample area of 600 square feet) representing 0.1% of the total disturbance area.

The sample areas shall represent the variety of conditions found on a project. A project that has both cut and fill slopes, for example, should have roughly the same number of

sample plots on cut as on fill. Final design plans should be utilized to identify each cut and fill slope. Each slope shall be assigned a number by the evaluator (e.g., C1, C2, C3; F1, F2, F3). The slopes to be sampled shall be randomly selected. The sample plot locations within each sampling area should be predetermined, either by selecting a point on the plans prior to going into the field, or by using the same selection method in the field for each plot. For example, on a roadway project, the midpoint (longitudinally) of the cut or fill could be identified in the field, and from that point a set number of paces could be taken from the edge of road to arrive at the sampling location. If conditions at the predetermined sample plot location are not typical of the project site the location of the sample plot may be adjusted.

In order to determine if a reseeded site has achieved 70% of the vegetative coverage of the surrounding, undisturbed landscape, it is necessary to conduct sample plot measurements for those undisturbed areas in a manner similar to the reseeded portions of the project site. A corresponding undisturbed sample plot shall be established for each project site sample plot, the location of which should be determined before going into the field. In the above roadway project example, the location for the undisturbed plot could be along an extension of the same theoretic line as the project site sample plot (perpendicular to the roadway) at a set number of paces beyond the limit of construction disturbance.

A sampling frame, preferably of a circular shape (to reduce edge effect) should be utilized to delineate the sample plot. When a single 25 square foot sample is used, the frame shall be dropped at the sample location. If four 25 square foot sub-plots are required to obtain a total sample of 100 square feet, the sub-plots shall be established in each ordinal direction and within a few feet of the intended sample location.

The cover provided by perennial vegetation and inert material (gravel, cobble, boulders) shall be documented. The percentage of vegetative cover shall be determined as noted below. The percentage of inert material shall be estimated by the evaluator.

All perennial plants encompassed by the sampling frame should be counted, including plants on which the frame lands. Dividing the frame into quadrants may make counting the plants easier. The species and canopy diameter of each plant shall be recorded. The area covered by the plant can be calculated based on the recorded canopy diameter. The sum of the canopy area of all perennial plants shall be used to calculate the vegetative cover percentage within the sample plot area. If multiple sample plots are required for a single project, the average cover percentage of all plots shall constitute the reseeded/unpaved cover percentage. Inert material cover should be visually estimated as a percentage of the total area within the sampling frame.

A photograph should be taken of each sample plot. The photograph should include the area encompassed by the sampling frame and a label identifying the plot.

The sum of the perennial vegetation and/or inert material coverage percentages will be used to determine if final stabilization has been achieved. As the AZPDES permit

stipulates, "A uniform perennial vegetative cover with a density of 70% of the native background vegetative cover" or "equivalent permanent stabilization measures" must occur before final stabilization is considered to have been achieved. In a situation where neither perennial vegetative cover nor inert material cover individually meet the 70% coverage requirement, the two types of cover may be combined. For example, if the perennial vegetation provides cover equivalent to 50% of the background cover, and the inert material provides 25% cover, the combined coverage (75%) would exceed the minimum requirement of 70% for final stabilization.

The draft results of the above analysis shall be provided to the ADOT Roadside Development Section (Roadside) in a memo format, with appropriate backup documentation and calculations to support the memo conclusions. At a minimum, a declarative statement similar to the following shall be provided: "The _____ project has achieved __% coverage in unpaved areas and has/has not achieved final stabilization as defined by AZPDES." Once the results have been agreed to by Roadside, ___ copies of the memo shall be submitted to Roadside for distribution.